REMARKS

In the Office Action of November 30, 2005, claims 8, 20 and 21 were indicated as containing allowable subject matter and such indication is gratefully acknowledged. Claims 8 and 20 have been amended to become independent claims. Claim 21 depends from claim 20, so these three claims are seen as allowable. Claim 21 has been amended in one minor respect for clarification. Claim 7 has been cancelled as its subject matter was incorporated in claim 8.

Also, in the Office Action of November 30, 2005, claims 1, 2, 5, 9, 11-15, 17, 18 and 19 were rejected under 35 U.S.C. 102 (b) as anticipated by Rosenberg, U.S. Pat. No. 3,411,027.

Applicant has previously responded at to reasons why the claims distinguish from Rosenberg to which the Examiner has replied as follows at page 6 of the Office Action of November 30, 2005:

Response to Arguments

> Applicant's arguments filed 10/11/2005 have been considered but they are not persuasive. Applicant's argument regarding flux traveling through the permanent magnets of Rosenberg is not persuasive because the magnetic flux from the permanent magnet will inherently flow from the south to the north poles and back to the south pole.

Taking the statements in the Examiner's Response to Arguments, one at a time, this first statement does not show an understanding of the fundamental difference between the claimed invention and Rosenberg. As seen in Figs. 1a and 1b of the present application, the PMs are conducting in one mode (See Fig. 1c reproduced below) and blocking in the other mode (See Fig. 1b reproduced below). Rosenberg doesn't teach this. It is not inherent, as the Examiner says, that the PMs conduct all of the time, because the polarity of the flux is controlled by the polarity of the

current in the stationary excitation coil which is claimed in claim 1 and claim 13.

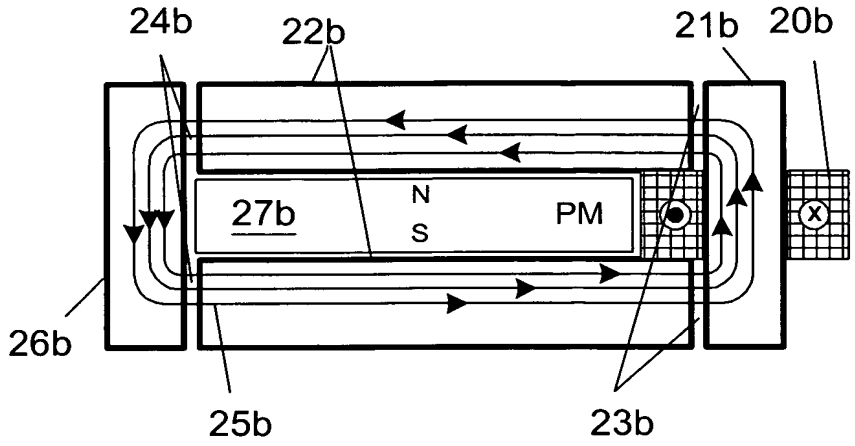


Fig. 1b

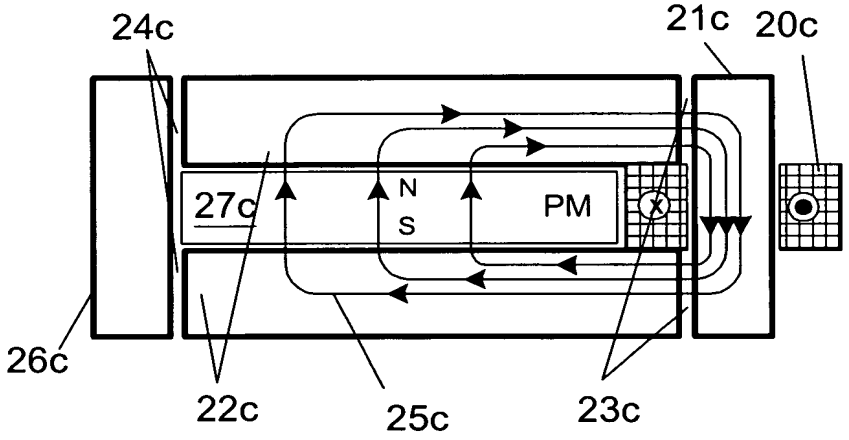


Fig. 1c

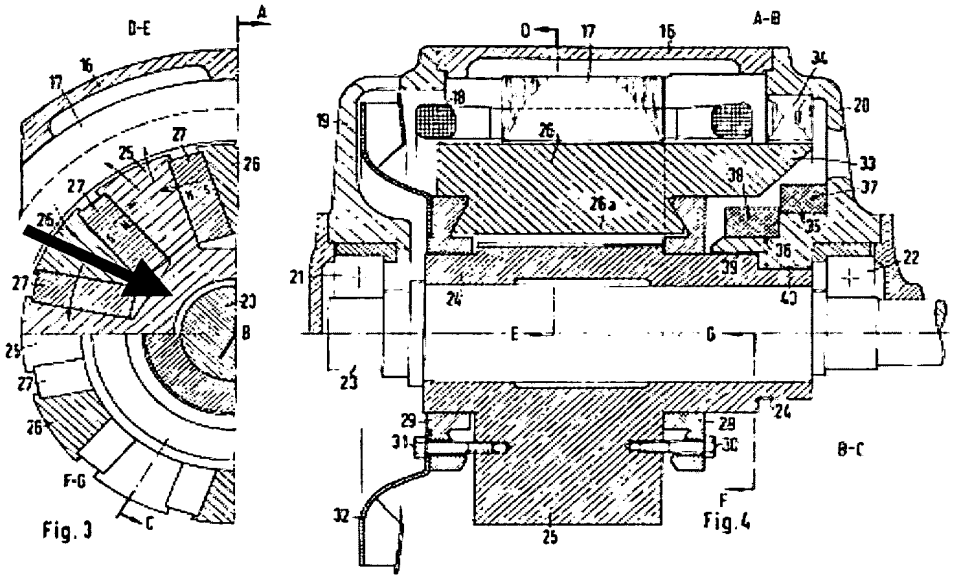
Figs. 1b and 1c, Hsu, U.S. Appl. No. 10/668,586

The next statement in the Examiner's response to Arguments is as follows:

> Applicant's arguments filed 10/11/2005 have been considered but they are not persuasive. . . . Applicant's argument regarding the flux leakage from the axial ends of the rotor or the magnet extending axially beyond the stator is not persuasive because the limitation is not claimed.

The point here is that Rosenberg is not teaching protection against flux leakage in the radial direction, or in any direction, which protection is provided by the present claimed invention (Fig. 1b above.)

In Fig. 3 and 4 of Rosenberg, seen below, flux is shown by the arrows as traveling through the PM material from poles 26 to poles 25. Flux would also leak from pole 26 between magnets 27 along a radial path as shown by the heavy black arrow.



This is contrary to the teaching of Fig. 1b above and contrary to the following language from claim 1:

"wherein permanent magnet (PM) material is disposed between the rotor pole portions and is also disposed between rotor pole portions of one polarity and the core portion of the rotor for containing the component of flux in the rotor pole portions as the component of flux is conveyed to the radial air gap and for inhibiting the component of flux from leaking from said pole portions prior to reaching the radial air gap when said direct current is of the first polarity."

In the present invention, direct current flux is blocked along the radial path in the flux enhancement mode (current of one polarity) (Fig. 1b) and allowed to flow in

the flux weakening mode (current of another polarity) (Fig. 1c).

Consequently, the flux leakage in Rosenberg machines during field enhancement (represented by Fig. 1b in the present application) would be extreme. In Rosenberg's teaching, the permanent magnets are used only for defining the magnetic poles and are located approximately along radii from the axis of rotation. This allows leakage out the bottom of the poles between the PMs and other places mentioned above.

Claims 1 and 13 have been amended to further distinguish from Figs. 5 and 6 in Rosenberg, where a different technique is used. In these Figures there is an enlarged cross section 53 of the shaft of <u>non-magnetic material</u> underneath the poles. This is the only reason that flux does not leak radially between magnets 54 as shown by the heavy black arrow.

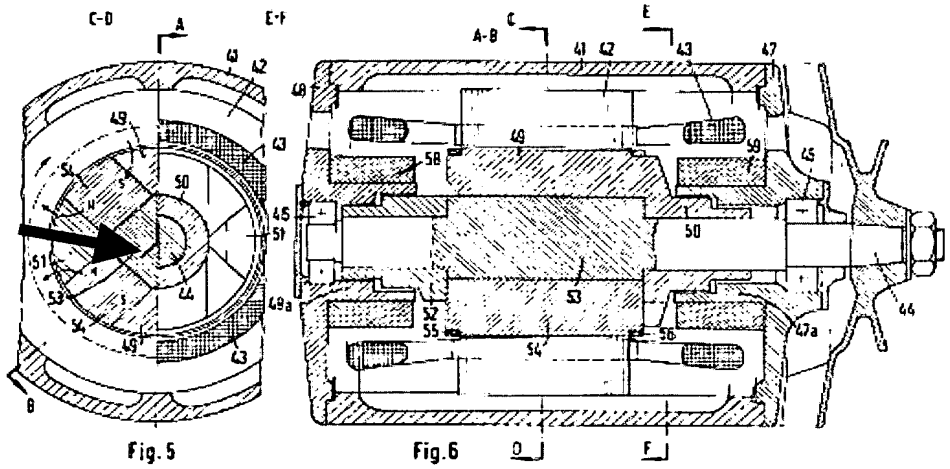


Fig.5 Fig.6

The third and last statement in the Examiner's response to Arguments is as follows:

> Applicant's arguments filed 10/11/2005 have been considered but they are not persuasive. . . .
> Applicant's argument regarding the flux leaking between the poles is not persuasive because it is known to form the rotor magnets as separate magnets.

This statement in the Office action is not understood. Applicant has claimed a positioning of the PMs not seen in Rosenberg. This positioning is shown below.

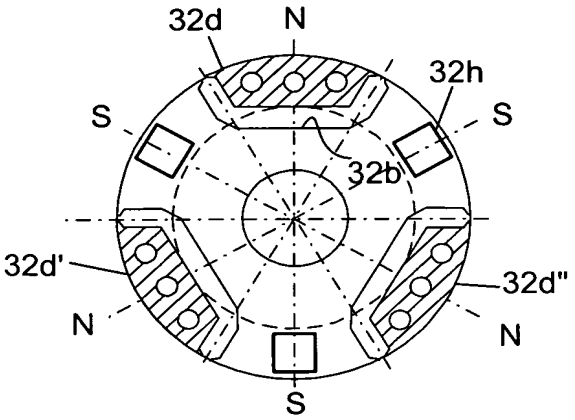


Fig. 5

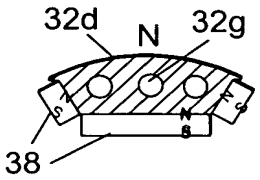


Fig. 5a

It can be seen that PM material 38 in longitudinal groove 32b will prevent flux from leaking to a rotor core portion 32a (Figs. 2, 3) which are part of the S poles in one mode, but allow leakage when the flux weakening mode is employed by reversing polarity of the excitation coil.

The flux blocking action is claimed in claim 1 as follows:

"wherein permanent magnet (PM) material is disposed between the rotor pole portions and is also disposed between rotor pole portions of one polarity and the core portion of the rotor for containing the direct current component of flux in the rotor pole portions as the direct current component of flux is conveyed to the radial air gap and for inhibiting the direct current component of flux from leaking from said pole portions prior to reaching the radial air gap when said direct current is of the first polarity"

On 11 January 2006, an Interview was held with the Examiner. The opportunity for an interview and the courtesies extended by the Examiner are gratefully acknowledged.

The Summary of Interview stated as follows:

> "Applicant proposes amending the claims to include the core portion of magnetic material to inhibit flux leakage from the rotor pole pieces in the enhancement mode of the first polarity. The examiner believes the amendment overcomes the 102b rejection over Rosenberg, which does not show a magnet positioned between the rotor poles and the magnetic core portion. Applicant strongly believes that this is not shown or suggested in Rosenberg. Applicant may file a declaration by the inventor to support his position. The examiner and applicant did not address the existing 103 rejection over Koharagi."

As discussed during the Interview, a Declaration of the inventor is submitted herewith to confirm certain facts that have been discussed in this record.

The Examiner noted that the proposed combination of Koharagi with Rosenberg was not discussed at the Interview. Applicant wished to clarify the understanding of Rosenberg before proceeding to discuss Koharagi.

While Kohargi discloses magnets of a shape that superficially resemble the cross sectional shape of the PMs in the present invention, it is believed that Koharagi does not suggest a modification of Rosenberg to provide the subject matter of claims 1, 5, 13 and 19 for the following reasons.

In Koharagi, the PMs in Fig. 4 and 6 are used to separate the poles, but their purpose is to reduce q-axis reactance when the rotor is driven by a sensorless (no position or speed feedback) vector controller. (Hsu declaration, para. 7) A vector controller is an AC type of control, which resolves AC voltage and current into q-axis, d-axis and many other quantities in the controller but nevertheless directly controls magnitude and frequency of AC quantities and does not directly control DC inputs on a motor. (Hsu declaration, para. 7) There are no DC coils supplying additional DC flux to add to the AC flux in the

motor in Koharagi. (Hsu declaration, para. 7)

Thus, neither Rosenberg nor Koharagi suggest the following combination from claim 1:

> "at least one stationary excitation coil assembly for receiving direct current from an external source and being positioned across the secondary air gap so as to induce a direct current component of flux in the rotor pole portions . . . ;and
>
> "wherein permanent magnet (PM) material is disposed between the rotor pole portions and is also disposed between rotor pole portions of one polarity and the core portion of the rotor for containing the direct current component of flux in the rotor pole portions as the direct current component of flux is conveyed to the radial air gap and for inhibiting the direct current component of flux from leaking from said pole portions prior to reaching the radial air gap when said direct current is of the first polarity."

Because Koharagi does not disclose the auxiliary direct current or second excitation flux of claims 1, 5, 13 and 19, its motivation in providing the PMs of the shape indicated is different than in the present invention and in Rosenberg, which would not suggest to one of ordinary skill to substitute them into Rosenberg's construction.

Koharagi also does not show insertion of pole pieces to carry the DC current in an axial direction (claims 5 and 19) and does not indicate that there is any direct current or second component or any non-radial component of flux. There is, in fact, no longitudinal section view in Koharagi.

What is lacking in the obviousness rejection of claims 1, 5, 13 and 19 is any clear motivation or suggestion to make the proposed modification to Rosenberg by attempting to utilize the PMs of Koharagi as proposed in the Office action.

The present inventor is the only one to have recognized the problem with Rosenberg's teaching and the solution.

MPEP 2143.01 provides that: "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. *In re Kotzab,* 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee,* 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992)."

MPEP 2143.01 further provides that "[t]here are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. *In re Rouffet,* 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper.) The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999)."

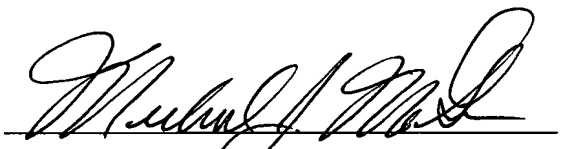
Dependent claim 5 has been amended to further define the action of the pole pieces in conveying the DC flux. Support is found in paragraph 0042 of the specification. The remaining dependent claims all depend directly or indirectly from claims 1 and 13 and are seen as allowable for at least the same reasons. The other cited art does not

add to Rosenberg and Koharagi with respect to the issues discussed above.

CONCLUSION

In view of the amendment and remarks, reconsideration of the application is respectfully requested. Claims 1-6 and 8-21 remain pending and a Notice of Allowance for these claims is earnestly solicited. A fee sheet is submitted herewith to pay for the extra independent claim.

Respectfully submitted,

By: 

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